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Rivers Draining Eastern Tibet: Geomorphologic Description and Inferences

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Large rivers draining the eastern Tibetan Plateau include, from west to east, the Tsangpo, Salween, Mekong, and Yangzi Rivers. Their basin sizes range from 80,000 to 130,000 km². Geomorphic characterization of these four major rivers and their drainage basins reveals that the Tsangpo River has a very different geomorphic expression than do the Salween, Mekong, and Yangzi Rivers (also known as the 'Three Rivers'). A basin-wide length-to-width ratio of 2 shows that the Tsangpo drainage is much rounder than the linear and arcuate Salween, Mekong, and Yangzi Rivers, which exhibit L-W ratios of approximately 8, 6, and 7, respectively. Within the Tsangpo drainage basin, tributary areas are much larger on the north side of the Tsangpo versus the south. This is also reflected in the basin-average asymmetry of the Tsangpo, whose vector points to the SSW and has the largest (0.27) magnitude of asymmetry of the four basins. The relatively high hypsometric integral of the Tsangpo River (0.591, compared to 0.560, 05.81, and 0.551 in the Salween, Mekong, and Yangzi Rivers, respectively) indicates more basin-wide dissection than throughout the Three Rivers region. Mean Tsangpo basin-wide relief calculated over a 1-km radius moving circle is 711 ± 344 m --- significantly higher than the 505 ± 220 m, 510 ± 225 m, and 588 ± 232 m that characterize the Three Rivers. The highest relief and slope values within the basins of the Three Rivers are found within 1 km of the main channel. Relief and slope values decrease dramatically upstream in the Salween, Mekong, and Yangzi Rivers at a change in the stream longitudinal profiles and is a pattern that can be traced across the Three Rivers. This appears to be a point north of which fluvial dissection has not progressed. These basin- averaged metrics are consistent with and complement previous studies that concentrated solely on stream and basin geometry. West to east and

north to south transitions in the metrics might reflect deeper structure related to the Indian plate indentor.

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